UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,087	07/31/2003	Jonathan Jay Bernstein	MA03-004	2028

31362 7590 06/20/2005

JOANNE N. PAPPAS
45 NAGOG PARK
ACTON, MA 01720

EXAMINER	
CHOI, WILLIAM C	

ART UNIT	PAPER NUMBER
2873	

DATE MAILED: 06/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/631,087	BERNSTEIN ET AL.	
	Examiner	Art Unit	
	William C. Choi	2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-9,14 and 19* is/are rejected.

7)☒ Claim(s) *3,10-13,15-18,20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 January 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *0405*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

The indicated allowability of claims 1-15 and 17-20 is withdrawn in view of the newly discovered reference(s) to Moon et al (U.S. 2003/0095307 A1). Rejections based on the newly cited reference(s) follow.

Information Disclosure Statement

Receipt of the Information Disclosure Statement (IDS) with copies of the references cited therein, was received on 4/18/2005. An initialized copy of the IDS is enclosed with this office action.

Claim Objections

Claim 1 is objected to because of the following informalities: in line 4, a "," should be inserted after "mirrors". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 4-9, 14 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Moon et al.

In regard to claim 1, Moon et al discloses a spatial light modulator system comprising: a high fill factor MEMS array of tilting mirrors used to attenuate a plurality of wavelength channels in an optical network (page 5, sections [0093] & [0094], Figure 3); and an interface control circuit controlling said array of tilting mirrors (page 5, section [0093], lines 3-5, Figure 3, "90"), said interface circuit receiving and storing control signals to reconfigure wavelength channel definitions (pages 5 & 6, section [0094]).

Regarding claim 2, Moon et al discloses wherein said control circuit and said array of mirrors are fabricated on the same monolithic substrate (page 7, section [0108], lines 1-7 & 17-27, Figure 11).

Regarding claim 4, Moon et al discloses wherein said control signals further comprise definitions for the extent of each of said plurality of wavelength channels (page 4, sections [0081] & [0082] and pages 5 & 6, section [0094]).

Regarding claim 5, Moon et al discloses wherein the control signals further comprise a desired attenuation within each of said plurality of wavelength channels (page 4, sections [0081] & [0082] and pages 5 & 6, section [0094]).

Regarding claim 6, Moon et al discloses wherein said MEMS array is linear (Figure 3).

Regarding claim 7, Moon et al discloses wherein said high fill factor is greater than or equal to 90% (page 5, section [0091], lines 4-6).

Regarding claim 8, Moon et al discloses wherein each mirror in said MEMS array of tilting mirrors further comprises a single tilting cantilever supported by two flexures (Figure 11, "Hinge").

Regarding claim 9, Moon et al discloses wherein each mirror has at least one actuation electrode (page 7, section [0108], lines 10-13, Figure 11)

Regarding claim 14, Moon et al discloses wherein each mirror in said MEMS array of tilting mirrors is supported by symmetrically located flexures whose rotational axis passes through the center of gravity of the mirror (Figure 11, "Hinge" & Figure 12, "205").

Regarding claim 19, Moon et al discloses wherein each of said MEMS mirrors is fabricated of a metal layer (page 7, section [0108], lines 7-8, Figure 11, "204")

Allowable Subject Matter

Claims 3, 10-13, 15-18 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented in claim 3: a spatial light modulator system comprising a MEMS array of tilting mirrors and an interface control circuit as claimed, specifically wherein said control circuit and said array of mirrors are not fabricated on the same monolithic substrate.

The prior art fails to teach a combination of all the claimed features as presented in claims 10 and 11: a spatial light modulator system comprising a MEMS array of tilting mirrors and an interface control circuit as claimed, specifically wherein each mirror in said MEMS array comprises a single tilting cantilever with an asymmetric flexure resulting in 2-axis rotation.

The prior art fails to teach a combination of all the claimed features as presented in claim 12 and 13: a spatial light modulator system comprising a MEMS array of tilting mirrors and an interface control circuit as claimed, specifically wherein each mirror in said MEMS array is supported by side support flexures whose rotational axis is offset from the center of gravity of the mirror.

The prior art fails to teach a combination of all the claimed features as presented in claim 15: a spatial light modulator system comprising a MEMS array of tilting mirrors supported by symmetrically located flexures and an interface control circuit as claimed, specifically wherein each mirror further comprises a means for providing strain relief.

The prior art fails to teach a combination of all the claimed features as presented in claim 16: a spatial light modulator system comprising a MEMS array of tilting mirrors and an interface control circuit as claimed, specifically wherein each mirror has at least one landing electrode having a same potential as said mirror.

The prior art fails to teach a combination of all the claimed features as presented in claims 17 and 18: a spatial light modulator system comprising a MEMS array of tilting mirrors and an interface control circuit as claimed, specifically wherein each mirror in said MEMS array further comprises means for maintaining mirror flatness.

The prior art fails to teach a combination of all the claimed features as presented in claim 20: a spatial light modulator system comprising a MEMS array of tilting mirrors and an interface control circuit as claimed, specifically wherein said mirror layer is polished flat using a CMP (Chemical Mechanical Planarization) Technique.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Choi whose telephone number is (571) 272-2324. The examiner can normally be reached on Monday-Friday from about 9:00 am to 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WC.
William Choi
Patent Examiner
Art Unit 2873
June 13, 2005

Georgia Epps
Supervisory Patent Examiner
Technology Center 2800